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November 21, 2000

11/21/00 Marilyn B. McKenna

Date Signature

Atty Dkt No. 10972039-2
R&A No. 5000-0029

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Reid A. BRENNEN et al.

Group Art Unit: 1756

Serial No.: 09/233,694

Examiner: C. Young

Filing Date: January 19, 1999

Title: METHOD FOR PRODUCING HIGH-SURFACE AREA TEXTURING OF A SUBSTRATE, SUBSTRATES PREPARED THEREBY AND MASKS FOR USE THEREIN

OK to enter Cmy 12/5/00

DECLARATION OF REID A. BRENNEN SUBMITTED PURSUANT TO 37 C.F.R. § 1.132

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

I, Reid A. Brennen, hereby declare that:

1. I am one of the joint inventors of the subject matter sought to be patented in the above-identified patent application and have been requested by Michael J. Beck, an attorney of record on the patent application, to review the application and the pending claims, the September 22, 2000 Office Action, the response to the Office Action which accompanies this declaration, and U.S. Patent Nos. 5,571,410 to Swedberg et al. and 5,658,413 to Kaltenbach et al.

2. It is my understanding that all claims currently pending were rejected as anticipated by or obvious over either one of the two cited patents, Swedberg et al. or Kaltenbach et al. I

have been informed that "anticipation" in this context is intended to mean that every element of the claims are either expressly or inherently disclosed in the cited patents. I also have been informed that "obviousness" in this context is intended to mean that the differences between the subject matter sought to be patented and the cited patents are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains.

3. In connection with the present analysis, I have reviewed the subject patent application and the pending claims, the September 22, 2000 Office Action, the accompanying Response to Final Rejection and the cited references, i.e., Swedberg et al. and Kaltenbach et al. My opinions as set forth herein are based on my understanding of the claimed invention and the cited references, and are drawn from my knowledge of the inventive subject matter and of the art of laser ablation and microfluidics.

QUALIFICATIONS

4. I am employed by Agilent Technologies, Inc./Hewlett Packard Laboratories, as a Member of Technical Staff for microfluidics engineering projects, a position I have held since 1996. Prior to my employment at Agilent Technologies/Hewlett Packard, I was employed as a Member of the Technical Staff on microfabrication projects at Jet Propulsion Laboratory. I received a Ph.D. in Mechanical Engineering Design (1993), a M.S. in Mechanical Engineering, (1989), and a B.S. in Mechanical Engineering (1987), each from the University of California, Berkeley. My Curriculum Vitae is attached to my declaration as Appendix A.

QUESTION

5. The question to which I have directed my attention is as above, i.e., whether, in my opinion, the claimed invention is inherently anticipated by or obvious over either one of Swedberg et al. or Kaltenbach et al.

OPINION

6. I understand that each of the claims at issue involves "high-surface area texturing of a surface that results in an increase in the surface area by at least 10-fold to 100,000-fold." Examples of high-surface area texturing of surfaces that results in a surface area increase by at least 10-fold to 100,000-fold are illustrated in FIGS. 4A-4G of the subject application.

7. Upon my review of the data which I address below, it is my opinion that the claimed high-surface area substrates and devices are neither anticipated by nor obvious in view of the cited references.

8. Attached to my declaration as Appendix B are FIGS. 11 and 12. These figures are a scanning electron micrographs of microchannels produced in a Kapton® sheet through laser ablation as generally described by Swedberg et al. and. Kaltenbach et al. FIG. 11 illustrates a typical laser-ablated microchannel that exhibits a substantially defect free surface, and FIG. 12 illustrates an imperfectly formed microchannel.

9. With respect to anticipation, it is my opinion that while laser ablation has been disclosed by the cited references, neither reference discloses high-surface area texturing or an increase in surface area by at least 10-fold to 100,000-fold. In addition, it is evident from visual observation of the micrographs of FIGS. 11 and 12 that the surface area the Kapton® sheets on which the microchannel laser is ablated are not substantially increased through ablation by at least 10-fold to 100,000-fold.

10. My determination of nonobviousness is based on a visual comparison of FIGS. 4A-4H with FIGS. 11 and 12. It is evident from visual inspection that the surface shown in FIG. 11 does not suggest the surfaces illustrated by FIG. 4A-4H. FIG. 11 shows a microchannel formed through laser ablation and having a smooth surface, in contrast to the extensive coning and associated high surface area illustrated in FIG. 4A-4H. While FIG. 12 shows a microchannel exhibiting a slight degree of coning, it is evident that such coning represents defects within the channel and is thus generally considered undesirable. Accordingly, neither micrograph suggests

high-surface area texturing of a surface that results in an increase in the surface area by at least 10-fold to 100,000-fold.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 20 November 2000 _____
Reid A. Brennen